Habitat mapping and possibilities for evaluation on environmental management of Vésztő-Mágor Nature Reserve

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Abstract: Habitat mapping was carried out on Vésztő-Mágorpuszta Nature Reserve based on the Hungarian National Habitat Classification System. Habitat codes occurring within habitat patches and short description of each patch are given in parallel with a detailed species list (completed with dominance relations). Based on these, a habitat map of the area and habitat-based thematic maps of sodic areas influenced by water were prepared. The central part of the observed area is diverse and valuable from a botanical point of view, part of the area with complex patches is sodic, in between with sporadic lowland swards and some smaller lowland steppes. Possible reason for abandonment of management on these areas could be the influence of water. Rate of areas with higher dominance of weeds is small.

Keywords: habitat map, naturalness value, saline associations

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Introduction

The mapping of Vésztő-Mágorpuszta nature conservation area was done in the frames of the Hungarian Biodiversity Monitoring Programme. The primary goal of the survey was the regional monitoring of the condition of the living world, the habitat-mapping of the area. We have also created a habitat-map-based thematic map about the area that was originally visited in order to be habitat-mapped. This work was done based on the data-samples collected in the area, in order to better record, emphasise and value the main characteristics.

Materials and Methods

We completed the survey of Mágorpuszta. The field surveys included scouring the area many times in the whole vegetation period. While taking samples we followed the ideas to be found in the 2nd and 3rd chapter of Kovácsné Láng and Török (1997) IV. During the field work we used a basic M=1:25000 EOV map, where we marked the habitat-spots using ordinal numbers. Thanks to the mosaic structure of the area a given habitat-spot usually means the collective occurrence, the complex of more than one habitat. After we determined the GHHCS category/categories to each individual spot, we provided a detailed list of species – emphasising the protected and invasive species –, and we gave habitat-characterisations based on the condition and main characteristics of the habitat-spot.

Following the making of habitat-maps and the elaboration of the data in charts we created the habitat-maps using the ArcView GIS 3.1 software. The digitalisation and correction of the habitat-maps were assisted

Table 1. A general diagram about the methods of creating thematic maps

Topics	Habitat-spots based on GHHCS categories
	GHHCS
Areas affected by water	**A** Euhydrophyte habitats
	B Marshes
Expansion of saline areas	**F** Halophytic habitats
Saline habitat types	
	F1 *Artemisia* salt steppes
	F2 Salt meadows
	F3 Tall herb salt meadows
	F4 Puccinellia swards
	F5 Annual salt pioneer swards
Characteristic habitats	
	D4 Lowland eu- and mesotrophic meadows
	F Halophytic habitats
	H5 Closed loess and sand steppes
	J4 Riverine willow-poplar woodlands
	J5 Riverine ash-alder woodlands
	J6 Riverine oak-elm-ash woodlands
	K1 Lowland oak-hornbeam and closed sand steppe oak woodlands
	S Forestry plantations
	T Agricultural habitats

by the EOV sections used as basic maps and aerial photos. During the field survey we digitally matched the characteristics of the spots to the spots, which later provided us with the possibility to value the area in different respects comprehensively. The colouring used by depicting the habitat-spots helps in easier distinction of the border-lines, but has no further informational value. The identification of the habitats is available by the ordinal numbers, since the great number of spots (178) makes a colour-based distinction impossible.

In order to make a more comprehensive valuation of the area we have also created some thematic maps of different positions using the maps of the habitat-spots. Considering the natural characteristics of Mágorpuszta we depicted the following characteristics on the maps: areas affected by water, expansion of saline areas, saline habitat types, and characteristic habitats.

By creating the thematic maps we used the habitat-patch-maps as basic maps, and we picked the habitat-spots according to different topics, based on the GHHCS categories of the spots (*Table 1*).

While valuing the surveyed area we concentrated on the distribution of characteris-

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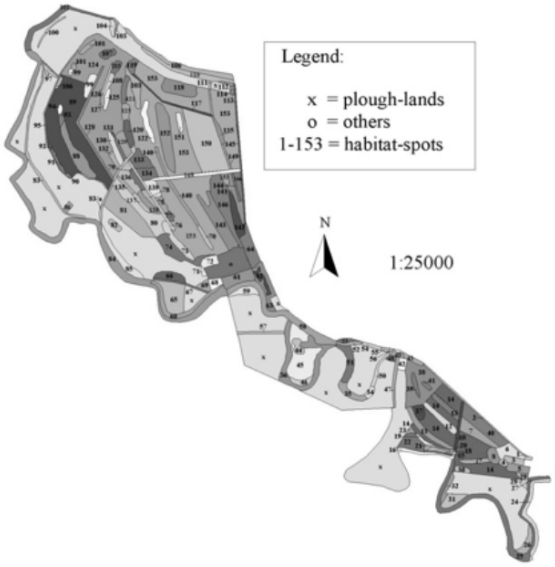

Figure 1. Habitat-map of Vésztő-Mágorpuszta

tic habitats, the expansion of the saline areas and the occurrence of their types according to the finished maps. Apart from the maps we have also finished diagrams for the valuation. For the general valuation and characterisation of the habitats of Mágorpuszta the maps and the diagrams provide the methods.

Results and Discussion

During the mapping of Mágorpuszta we distinguished 178 spots (*Figure 1*). The map consisting of 178 spots includes 153

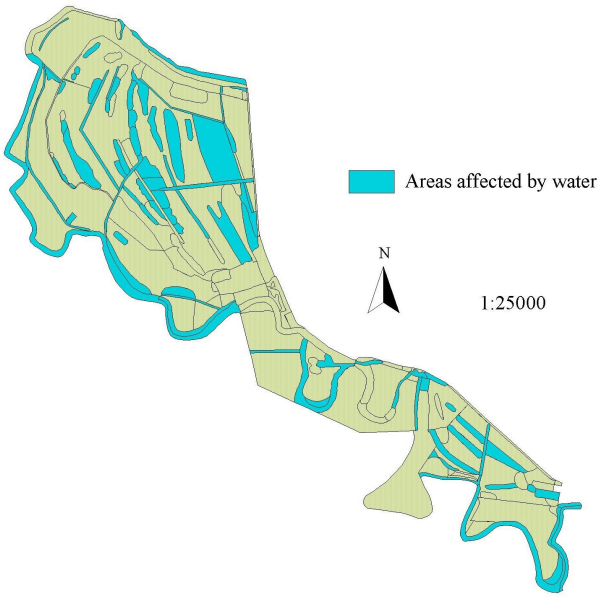

Figure 2: Areas affected by water in Vésztő-Mágorpuszta

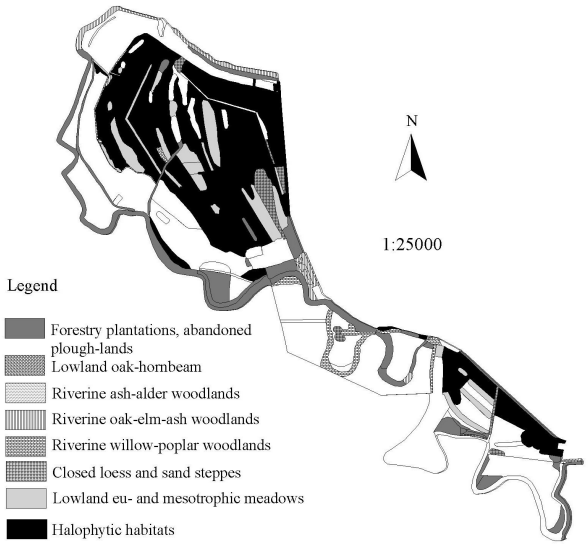

Figure 4: Characteristic habitats of Vésztő-Mágorpuszta

numbered habitat-spots. Based on the characteristics added to each spot it can be seen, that more than one GHHCS categories belong to a spot in most cases. Bordering the habitat-spots according to the GHHCS categories was not possible due to the great complexity of the area. From the separation and characterisation of the spots we can deduce information about the appearing, physiognomic and state-of-naturalness condition of the vegetation. The size and expansion of the habitat-spots can be said to be mosaic-like, made up of lots of small spots. The greater areas at the bottom boundaries of the key-formed area (W, SW parts) are mostly agricultural areas. The complexes made up of salty pastures and meadow de-

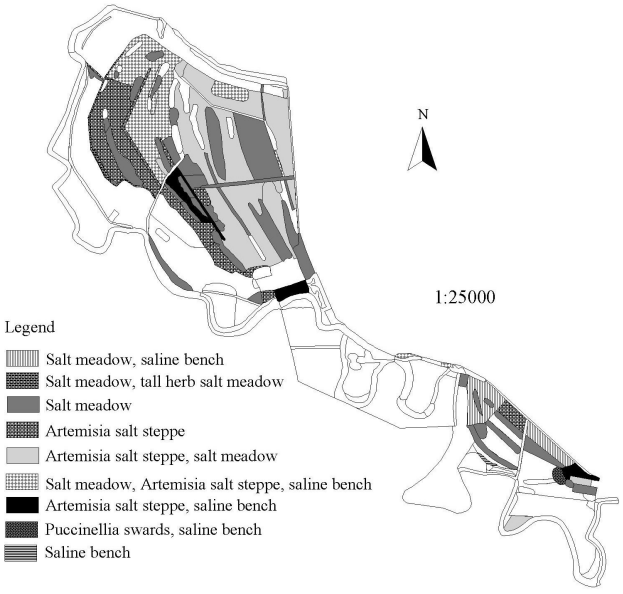

Figure 3: Halophytic habitat types of Vésztő-Mágorpuszta

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terminated by *Alopecurus* are significant in greater spots too.

According to *Figure 2*, it can be said that in three-quarter of the area those habitats are characteristic, that admit water effects of some form. Such areas are the woodlands near the canals, the lowland eu- and mesotrophic meadows, the euhydrophyte habitats, marshes and the wallows in the deeper parts of the halophytic habitats. It can also be noted, that abandoned plough-lands appear in greater numbers in areas affected by water, thus it can be concluded that the water was the reason of the ceasing of agriculture in those areas.

The types of halophytic habitats can be considered characteristic habitats of Mágorpuszta (*Figure 3*). These habitats can be found in 75% of this area. Among the halophytic habitats the complexes of *Artemisia* salt steppes and salt meadows are most common. In more than one habitat-spot the salt meadow type appears constantly. The triple complex of *Artemisia* salt steppes, salt meadows and saline bench is characteristic for 25% of the saline spots. The saline bench appear in more parts of the area, sometimes in the complexes of salt meadows or *Artemisia* salt steppes. The tall herb salt meadows and the saline bench of the halophytic habitat types rarely appear in independent spots, they are usually separated in complexes with other types.

The characteristic habitats of Mágorpuszta are shown on *Figure 4*. According to that the followings are to be pointed out: three-quarter of the area (the middle part) is saline. Between the saline areas some scattered lowland eu- and mesotrophic meadows can also be found, and a few small closed loess and salt steppes have also been formed. Along the Holt-Sebes Körös, that marks the boundary of the area run a number of forestry plantations, riverine oak-elm-ash, and willow-poplar woodlands. The riverine willow-poplar woodlands often appear together with forestry plantations (e.g. hybrid poplar, black-locust plantations), rows of trees and shrubberies. Alder-grove and lowland oak-hornbeam is significant only in spots. We can find many abandoned orchards, plough-lands in the surveyed area that are settled in cases by semi-natural sward, but the settlement of thick brush-woods, and/or black locust can also be characteristic. In some mosaic-like spots weedy lowland grass can also appear.

Conclusions

On the basis of the habitat-mappings in Vésztő-Mágorpuszta nature conservation area the following can be stated: the area can be well characterised thanks to the finished habitat-map and the habitat-map-based thematic maps, and these results can be used in later researches in connection with this area. Dependences of effects upon a causes can be revealed based on the characteristics of the habitat-maps of the area, the lists of species, and the GHHCS classifications. With the finishing of the habitat-map the first recording of conditions in the frames of the HBMS has been done, and thus the present state has been recorded. It is definitely desirable to follow the conditions and the changes of the area with attention. It is especially important, since this is the only way to see if the changes point towards naturalness or degradation, and the decisions that can diminish or stop the unfavourable conditions can only be made if the changes are observed. In conclusion, the present results mean starting points and guidelines towards the long-term goal, the preservation of biodiversity.

Acknowledgements

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